

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 0000053831	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/008097	International filing date (day/month/year) 24 July 2003 (24.07.2003)	Priority date (day/month/year) 12 August 2002 (12.08.2002)
International Patent Classification (IPC) or national classification and IPC C08F 226/06, 226/10, 226/04, 220/34, 220/60, 2/38, 8/44, A61K 7/06, 7/48		
Applicant <b>BASF AKTIENGESELLSCHAFT</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

- I  Basis of the report
- II  Priority
- III  Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV  Lack of unity of invention
- V  Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI  Certain documents cited
- VII  Certain defects in the international application
- VIII  Certain observations on the international application

Date of submission of the demand 02 December 2003 (02.12.2003)	Date of completion of this report 07 December 2004 (07.12.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/008097

**I. Basis of the report****1. With regard to the elements of the international application:\***

- the international application as originally filed  
 the description:

pages \_\_\_\_\_ 1-47 \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_ \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

- the claims:

pages \_\_\_\_\_ \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement under Article 19)  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_ 1-17 \_\_\_\_\_, filed with the letter of 19 October 2004 (19.10.2004)

- the drawings:

pages \_\_\_\_\_ \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

- the sequence listing part of the description:

pages \_\_\_\_\_ \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).  
 the language of publication of the international application (under Rule 48.3(b)).  
 the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**

- contained in the international application in written form.  
 filed together with the international application in computer readable form.  
 furnished subsequently to this Authority in written form.  
 furnished subsequently to this Authority in computer readable form.  
 The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
 The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

**4.  The amendments have resulted in the cancellation of:**

- the description, pages \_\_\_\_\_  
 the claims, Nos. \_\_\_\_\_  
 the drawings, sheets/fig \_\_\_\_\_

**5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\***

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/EP 03/08097

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	1-17	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-17	NO
Industrial applicability (IA)	Claims	1-17	YES
	Claims		NO

## 2. Citations and explanations

The following documents were considered in the present report:

D1: WO-A-00/05274

D2: WO-A-96/37525 (mentioned in the application)

D3: ANONYMOUS: "Dispersants and hyperdispersants and their applications" RESEARCH DISCLOSURE, KENNETH MASON PUBLICATIONS, HAMPSHIRE, GB, Vol. 443, No. 109, March 2001, XP007127825 ISSN: 0374-4353

D4: ANONYMOUS: "Cationic polymeric thickeners useful in fabric softeners" RESEARCH DISCLOSURE, KENNETH MASON PUBLICATIONS, HAMPSHIRE, GB, Vol. 429, No. 116, January 2000, XP007125401 ISSN: 0374-4353

D5: EP-A-0 574 335

D6: PATENT ABSTRACTS OF JAPAN Vol. 1997, No. 05, 30 May 1997 & JP-A-09 003793 (SUMITOMO CHEM CO LTD), 7 January 1997

D7: EP-A-0 893 117 (mentioned in the application).

1. The formal novelty of the amended claims 1 to 17 with respect to the disclosure of documents D1 to D7 is established (PCT Article 33(2)).

2. However, the subject matter of said amended claims 1 to 17 is obvious (PCT Article 33(3)), either in view of

the disclosure and teaching of document D1 (cf. the claims; page 10, lines 25-38; page 11, lines 4-14; page 3, line 21 to page 9, line 43) or in view of the general expert knowledge that the use of a regulator to reduce the molecular weight of a polymer also leads to a reduction in its viscosity and k value (cf. the statement of problem according to the application, page 4, lines 39-46, in conjunction with the results in table 2 on page 37, particularly entry 1 compared to v1).

The use of a regulator in the polymers according to the present application does not result in a surprising result with respect either to D1 or to common general knowledge in the art.

3. The claimed subject matter is industrially applicable (PCT Article 33(4)).

We claim:

1. The use of polymers obtainable by

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(i) free-radically initiated copolymerization of monomer mixtures of

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(a) at least one cationic monomer or quaternizable monomer

(b) optionally a water-soluble monomer,

(c) optionally a further free-radically copolymerizable monomer

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(d) at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds, and

(e) at least one regulator

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(ii) subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer,

in hair cosmetic preparations.

25 2. The use of polymers obtainable by

(i) free-radically initiated copolymerization of monomer mixtures of

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(a) at least one cationic monomer or quaternizable monomer

(b) optionally a water-soluble monomer,

(c) optionally a further free-radically copolymerizable monomer

35

(d) at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds, and

(e) at least one regulator

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(ii) subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer,

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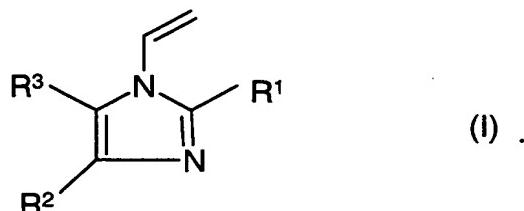
as conditioning agents in cosmetic preparations.

3. The use as claimed in claim 2 in skin and/or hair cosmetic preparations.

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4. The use as claimed in any of claims 1 to 3, where N-vinylimidazole derivatives of the formula (I), in which R<sup>1</sup> to R<sup>3</sup> are hydrogen, C<sub>1</sub>-C<sub>4</sub>-alkyl or phenyl, are used as monomer (a)

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5. The use as claimed in any of claims 1 to 3, where N-vinyllactams are used as monomer (b).

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6. The use as claimed in any of claims 1 to 3, where compounds which contain sulfur in bonded form are used as regulator (e).

25 7. The use as claimed in claim 6, where thiols are used as regulator.

8. A polymer obtainable by

30 (i) free-radically initiated copolymerization of monomer mixtures of

- (a) at least one cationic monomer or quaternizable monomer

35 (b) optionally at least one water-soluble monomer,

- (c) optionally at least one further free-radically copolymerizable monomer

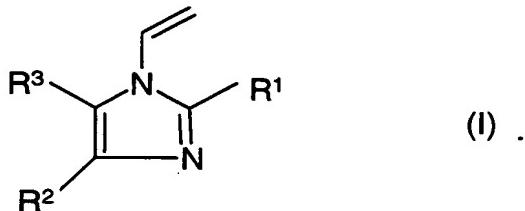
(d) at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds, and

- (e) at least one polyfunctional regulator

45 (ii) subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer.

9. A polymer as claimed in claim 8, where N-vinylimidazole derivatives of the formula (I) in which R<sup>1</sup> to R<sup>3</sup> are hydrogen, C<sub>1</sub>-C<sub>4</sub>-alkyl or phenyl are used as monomer (a).

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10. A polymer as claimed in claim 8, where vinyl lactams are used as monomer (b).

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11. A polymer as claimed in claim 8, where compounds which contain sulfur in bonded form are used as polyfunctional regulator (e).

20 12. A polymer as claimed in claim 11, where thiols are used as polyfunctional regulator (e).

13. A polymer as claimed in claim 8 obtainable by

25 (i) free-radically initiated copolymerization of monomer mixtures of

(a) 1 to 99.98% by weight of at least one cationic monomer or quaternizable monomer

30 (b) 0 to 98.98% by weight of at least one water-soluble monomer,

(c) 0 to 50% by weight of at least one further free-radically copolymerizable monomer and

(d) 0.01 to 10% by weight of at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds, and

35 (e) 0.01 to 10% by weight of at least one polyfunctional regulator

40 (ii) subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer.

45 14. A process for the preparation of polymers by free-radical initiated copolymerization of a monomer mixture of

(a) at least one cationic monomer or quaternizable monomer

- (b) optionally at least one water-soluble monomer,  
(c) optionally at least one further free-radically copolymerizable monomer  
(d) at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds,

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in the presence of a polyfunctional regulator (e)

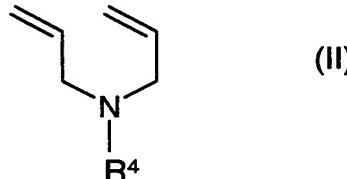
10 and subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer.

15. A polymer obtainable by

15 (i) free-radically initiated copolymerization of monomer mixtures of

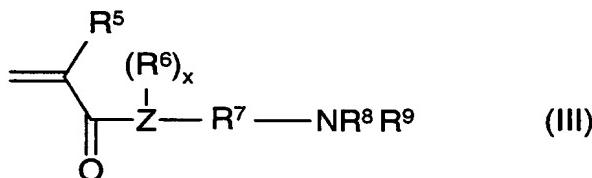
20 (a) at least one cationic monomer or quaternizable monomer chosen from the group consisting of diallylamines of the formula (II) in which R<sup>4</sup> is C<sub>1</sub>-C<sub>24</sub>-alkyl

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30 and N,N-dialkylaminoalkyl acrylates and methacrylates and N,N-dialkylaminoalkylacrylamides and -methacrylamides of the formula (III),

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where R<sup>5</sup>, R<sup>6</sup>, independently, are a hydrogen atom or a methyl radical, R<sup>7</sup> is an alkylene radical having 1 to 24 carbon atoms, optionally substituted by alkyl radicals, and R<sup>8</sup>, R<sup>9</sup> are C<sub>1</sub>-C<sub>24</sub>-alkyl radicals. Z is a nitrogen atom together with x = 1 or is an oxygen atom together with x = 0,

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- 5 (b) optionally at least one water-soluble monomer,  
(c) optionally at least one further free-radically copolymerizable monomer,  
(d) at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds, and  
(e) at least one regulator

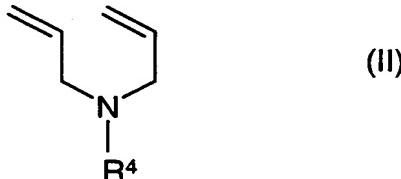
10 (ii) subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer.

16. A polymer as claimed in claim 15, obtainable by

15 (i) free-radically initiated copolymerization of monomer mixtures of

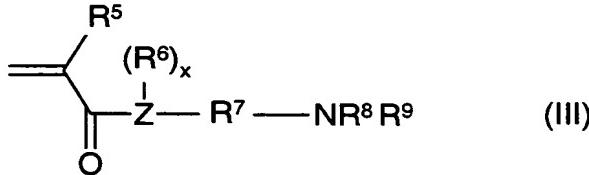
20 (a) 1 to 99.98% by weight of a cationic monomer or quaternizable monomer chosen from the group consisting of diallylamines of the formula (II), in which R<sup>4</sup> is C<sub>1</sub>-C<sub>24</sub>-alkyl

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30 and N,N-dialkylaminoalkyl acrylates and methacrylates and N,N-dialkylaminoalkylacrylamides and -methacrylamides of the formula (III),

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40 where R<sup>5</sup>, R<sup>6</sup>, independently, are a hydrogen atom or a methyl radical, R<sup>7</sup> is an alkylene radical having 1 to 24 carbon atoms, optionally substituted by alkyl radicals, and R<sup>8</sup>, R<sup>9</sup> are C<sub>1</sub>-C<sub>24</sub> alkyl radicals. Z is a nitrogen atom together with x = 1 or is an oxygen atom together with x = 0,

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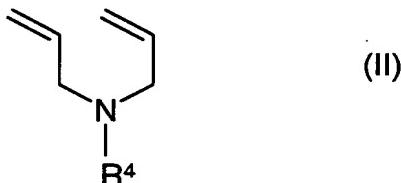
- (b) 0 to 98.98% by weight of at least one water-soluble monomer,  
(c) 0 to 50% by weight of at least one further free-radically copolymerizable monomer,  
**5** (d) 0.01 to 10% by weight of at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds, and  
(e) 0.01 to 10% by weight of at least one regulator

**10** (ii) subsequent quaternization or protonation of the polymer if the monomer (a) used is a nonquaternized monomer or an only partially quaternized monomer.

**15** 17. A process for the preparation of polymers by free-radically initiated copolymerization of a monomer mixture of

(a) at least one cationic monomer or quaternizable monomer chosen from the group consisting of diallylamines of the formula (II) in which R<sup>4</sup> is C<sub>1</sub>-C<sub>24</sub>-alkyl

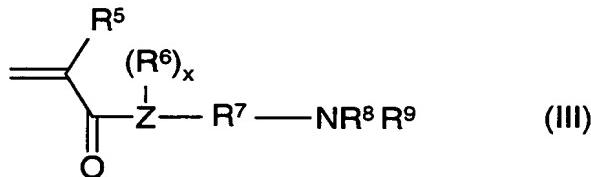
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and N,N-dialkylaminoalkyl acrylates and methacrylates and N,N-dialkylaminoalkylacrylamides and -methacrylamides of the formula (III),

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**35**

where R<sup>5</sup>, R<sup>6</sup>, independently, are a hydrogen atom or a methyl radical, R<sup>7</sup> is an alkylene radical having 1 to 24 carbon atoms, optionally substituted by alkyl radicals, and R<sup>8</sup>, R<sup>9</sup> are C<sub>1</sub>-C<sub>24</sub>-alkyl radicals. Z is a nitrogen atom together with x = 1 or is an oxygen atom together with x = 0,

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(b) optionally at least one water-soluble monomer,

**REPLACED BY  
ART 34 AMDT**

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- (c) optionally at least one further free-radically copolymerizable monomer,
- (d) at least one crosslinking monomer having at least two ethylenically unsaturated, nonconjugated double bonds,

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in the presence of a regulator (e)

and subsequent quaternization or protonation of the polymer,  
if the monomer (a) is a nonquaternized monomer or an only  
10 partially quaternized monomer.

18. The use of the polymers as claimed in at least one of claims 8 to 13 and/or claims 15 to 16 in cosmetic preparations.

15 19. The use of the polymers as claimed in at least one of claims 8 to 13 and/or claims 15 to 16 as conditioning agents.

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